

REMARKS

Status of the Application

Claims 1-13 are currently pending in the application for consideration by the Examiner. By this amendment, claims 1 and 3-10 will have been amended.

Accordingly, reconsideration of the pending rejections is requested in view of the instant amendment and the accompanying remarks.

Amendment to Claims 1 and 3-10 are Fully Supported by the Original Disclosure

The above amendments do not add new matter to the application and are fully supported by the specification, wherein such support may be found, *inter alia*, at page 14, lines 5-10 and Figures 4(a) and 4(b).

Claim Objections

The Office Action objected to claim 8 for containing informalities. Applicants have amended claim 8 in the above listing of claims to remove these informalities.

Section 112 Rejections

The Office Action rejected claim 1 of the present application for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. More particularly, the Office Action found a lack of support in the application for the term "redox system."

Applicants respectfully submit that the term "redox system" is a term that is familiar to and is an established term of art for a person of skill in the art. Specifically a redox system is "a chemical system in which oxidation and reduction reactions occur." (*See* www.answers.com/topic/redox-system). Furthermore, Applicants respectfully submit that examples of redox systems are described at paragraphs 49, 50, 53 and 54 of the present application. These examples of redox systems may be used in embodiments of the present invention, but as persons of skill in the art will appreciate other redox systems may be used in alternative/different embodiments of the present invention.

Section 102 Rejections

The Office Action rejected independent claim 1 of the present application as being anticipated by the Casimari reference. As amended, independent claim 1 includes the features that the first and the second redox systems are coupled with a conductive substrate and are configured to function in use as a working electrode. By contrast the Casimari reference discloses a system for measuring oxygen consumption by organic acids in which two of the organic acids are attached to a polypropylene gas permeable membrane. (*See* Casimari, at p.784). In the Casimari system consumption of oxygen by the organic acids is determined using an electrode system in which one of the electrodes is contacted with the permeable membrane to detect oxygen passing through the membrane. (*See* Casimari, at p.784)

Applicants respectfully submit that the Casimari reference does not teach or suggest coupling two redox systems with a conductive substrate for functioning in use as a working electrode. To the contrary, the Casimari reference teaches away from the sensor of the present application in that in the disclosed system of the Casimari reference the redox system is isolated/separated from the conductive substrate of the oxygen electrode.

Furthermore, as provided in the Casimari reference, the LOD enzyme catalyses the oxidation of L-lactate to pyruvate, which is detected by the oxygen electrode. (*See* Casimari at p.786). However, the amplitude of the reaction is limited by the amount of L-lactate present, so a second enzyme, LDH, amplifies the response by recycling the pyruvate back to L-lactate. This regeneration of L-lactate serves to provide more L-lactate substrate for the LOD enzyme and further enhances the electrochemical response detected. Therefore, in the context of the disclosure of Casimari, the substrate for the LOD enzyme is L-lactate and the substrate for the LDH enzyme is the pyruvate formed by the action of the LOD enzyme. Therefore, the two enzymes described by Casimari are not intended to and do not undergo a redox reaction with the same species as provided in independent claim 1.

Because the Casimari reference does not teach all of the features of independent claim 1 as amended, Applicants respectfully request that the Section 102 rejection of independent claim 1 and the claims depending from it be withdrawn.

Section 103 Rejections

The Office Action rejected independent claim 1 of the present application under 35 U.S.C. § 103(a) as being unpatentable over U.S. Patent No. 5,223,117 to Wrighton *et al.* (“Wrighton”) and rejected claims 2-13 as being unpatentable over Wrighton in view of several cited references. Wrighton discloses an electrochemical sensor with a working electrode comprising two surface-bound molecular species, a chemically insensitive species, which species functions as a reference, and a chemically sensitive species, a redox system, which redox system has a voltammetric response which is dependent on the concentration of a target chemical species, such as pH or CO. Wrighton teaches that the insensitive species and the sensitive redox system are disposed on the working electrode and concentration of a target chemical species is determined by measuring a potential difference between the current peaks of oxidation and reduction from two terminal, linear sweep voltammograms (*See* Wrighton col. 3, lines 19 to 31).

The Wrighton reference provides no teaching or suggestion that two different redox systems, which are both sensitive to the same chemical species, could provide an effective sensor system/detection methodology. For example, Wrighton does not mention or address how redox systems sensitive to the same species may affect one another when disposed as a working electrode, the likelihood of success of such a combination and/or whether an output from such a configuration would be useful. As such, Applicants respectfully submit that not only does Wrighton not teach all of the features of independent claim 1 as amended, it also provides no motivation for configuring an electro-chemical sensor using two different redox systems sensitive to the same species. In fact, absent improper hindsight, *i.e.*, using the teaching of the current application, Wrighton provides no suggestion or motivation to configure an electro-chemical sensor using two redox systems sensitive to the same species. Moreover, as provided in the present application, the use of two redox systems sensitive to the same species may provide a synergetic effect with respect to increased sensor sensitivity something that could not be understood from the Wrighton reference. (*See* Application at p.14, line 21 through p.15, line 12).

Applicants respectfully submit that none of the references cited in combination with Wrighton in the Office Action to reject the remaining claims of the application teach a sensor comprising two different redox systems sensitive to the same species that are configured to

function in use as a working electrode. Moreover, as with the Wrighton reference, none of the references cited in the Office Action suggest the use of more than one redox system sensitive to a species or make any mention regarding the likelihood of success of using multiple redox systems sensitive to the same species or any reason why such a configuration would be advantageous and not detrimental.

CONCLUSION

In view of the foregoing, it is submitted that the references of record do not anticipate or render obvious Applicants' invention, as recited in each of claims 1-13. The applied reference of record has been discussed and distinguished, while significant claimed features of the present invention have been pointed out.

Further, any amendments to the claims which have been made in this response and which have not been specifically noted to overcome a rejection based upon the prior art, should be considered to have been made for a purpose unrelated to patentability, and no estoppel should be deemed to attach thereto.

Accordingly, reconsideration of the outstanding Office Action and allowance of the present application and all the claims therein are respectfully requested and now believed to be appropriate.

Should the Examiner have any questions or comments, he is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,

/Helene Raybaud/
Helene Raybaud
Reg. No. L0531

January 25, 2010
Schlumberger Doll-Research
One Hampshire St
Cambridge, MA 02139
Direct: 617.768.2271
Fax: 617.768.2402